

GAS PHASE STUDIES OF BIOMOLECULES COMPLEXED TO LIGATED PLATINUM SPECIES

MICHELLE L. STYLES<sup>a</sup>, RICHARD A.J. OHAIR<sup>a</sup> AND W. DAVID MCFADYEN<sup>a</sup>

*a.* Department of Chemistry, University of Melbourne, VIC 3052 Australia

Metal complexes of amino acids and peptides have attracted considerable interest as both models of metal binding sites as well as a means of providing sequence information and side chain identification via tandem mass spectrometry. Due to the immense importance of platinum species in inhibiting tumor growth, the solution phase chemistry of complexation of amino acids with a variety of platinum complexes has been widely explored over the past decade.<sup>1</sup> Little is known, however, about the gas phase chemistry of these systems and further work in this area is warranted from both a fundamental aspect as well as for analytical mass spectrometry applications.

Recently we reported on the novel gas phase fragmentation reactions of cationic complexes of two common amino acids (glycine and cysteine) with platinum(II) and terpyridine.<sup>2</sup> Since then, we have examined the gas phase fragmentation reactions of all twenty common amino acids and model peptide derivatives with a variety of platinum(II) ligated species (namely terpyridine, diethylenetriamine, pentamethyldiethylenetriamine, ethylenetriamine and triamine) using multistage (MS<sup>n</sup>) collisional activation in a quadrupole ion trap tandem mass spectrometer in order to obtain a greater understanding of the intrinsic interactions between platinum(II) and simple biomolecules. The results of these experiments will be discussed in terms of the following factors:

- (i) the influence of the ligand attached to platinum on the formation of Pt(II) complexes with amino acids and their model peptide derivatives
- (ii) the influence of reactive amino acid side chains on the structure and formation of Pt(II) complexes with amino acids and their model peptide derivatives
- (iii) the influence of the ligand attached to platinum on the collisionally induced dissociation (CID) pathways of a number of common amino acids, and related model systems.
- (iv) the influence of reactive amino acid side chains on the fragmentation mechanisms of Pt(II) complexes with amino acids as opposed to the fragmentation mechanism of protonated amino acids in the gas phase.

1. (a) Kostic, N.M., *Methods Enzymol.*, **1993**, 226, 565; (b) Preobrazhenskaya, M.N., *Chem. Heterocycl. Compd. (Engl. Transl.)*, **1985**, 21, 13; (c) Ehlers, A.W.; Dapprich, S.; Vyboishchikov, S.F.; Frenking G., *Organometallics*, **1996**, 15, 105
2. O'Hair, R.A.J., *Eurr. Mass Spectrom.*, **1997**, 3, 90.